A Guide to Using

Model 1590 Torqo II

By Mesa Laboratories, Inc.
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Overview

Introduction

Mesa Laboratories, Inc. is an industry leader in the manufacture of precision torque measuring equipment. Over forty years of experience in the torque-testing field is reflected in every automated system.

Mesa’s commitment to supplying state of the art products has resulted in the development of the Torqo II and its patented measuring system.

The Model 1590 Torqo II with minimal maintenance will provide the user with years of trouble free service.

What’s Inside

This manual is designed to provide the user with a step-by-step procedure from receipt of the system through operation, maintenance and calibration.
About This Manual

For convenience, this manual is divided into a number of chapters. A brief description of each chapter follows.

Chapter 1: Unpacking and Inspection
This chapter is a guide to insure that the Torqo is received in proper condition and that all necessary components have been located.

Chapter 2: System Power Up
This chapter contains the required information for electrically connecting the system components and then powering up the system.

Chapter 3: Control Panel Features
This chapter contains a description of the Control Panel, Key Lock Switch and Emergency Stop Switch.

Chapter 4: Bottle and Cap Tooling
This chapter contains the required information for installing and adjusting the tooling that will be used for testing.

Chapter 5: Quick Start
This chapter contains a step-by-step procedure to help the user become familiar with the basic operation of the Torqo II in the Run Mode.

Chapter 6: Understanding the Run Mode
This chapter describes the menus and program features that are available in the Run Mode.

Chapter 7: Understanding the Program Mode
This chapter describes the menus and program features that are available in the Program Mode.
Chapter 8: Test Types and Their Menus
This chapter contains a description of the Torqo II test types and the menus that are used to select and program them.

Chapter 9: Creating a New Test Profile
This chapter contains a step-by-step procedure for creating a new test profile.

Chapter 10: Understanding the Operation Screen
This chapter contains a description of the features that are available on the Operation Screen.

Chapter 11: Setting the Re-application Torque
This chapter contains a description of the procedure for programming a re-application torque.

Chapter 12: Viewing and Printing Test Results
This chapter contains a description of the procedure for customizing the report that can be viewed and printed at the end of a test session.

Chapter 13: Deleting and Replacing Data
This chapter contains a description of the procedure for deleting and replacing data that has been saved.

Chapter 14: Performing a Life Test
This chapter provides a description and step-by-step procedure for programming and performing a life test.

Chapter 15: Gold Bottle Verification
This chapter describes the Gold Bottle and the procedure for using it to verify the calibration of the Torqo II.
Chapter 16: System Calibration
This chapter is intended to acquaint the user with the required Calibration Equipment, the Calibration Verification Process, the process for performing a User Calibration and the procedure for Selecting the Calibration to be used.

Chapter 17: Child Resistant Cap Option
This section is intended to acquaint the user with the features and use of this option.

Chapter 18: Using Windows CE
This chapter contains a description of the Windows CE feature and its use in the Torqo II.

Chapter 19: Transmitting Data to a PC
This chapter provides a description of the output port, cable requirements, communication protocol and procedure for transmitting test results automatically.

Chapter 20: Maintenance and Cleaning
This chapter describes the recommended maintenance that should be performed on the Torqo.
Conventions

The following conventions are used in this manual.

**Note:**
Provides additional information related to the current topic.

**Warning**
Alerts you to a danger that might result from doing or not doing a specific action.

**Caution**
Suggests precautionary measures to avoid problems.

**Important**
Reminds you to take specific action relevant to the procedure at hand.

**Tip**
Tells how to accomplish a procedure with the minimum number of steps.
Unpacking And Inspection

What’s Inside

This chapter provides the user with a checklist for the receipt of a new Model 1590 Torqo II.

Unpacking and Inspection

Your Torque meter was carefully inspected, both electrically and mechanically before shipment. Upon receiving this system, carefully unpack all items from the shipping container and check for any signs of damage that may have occurred during shipment.

Immediately report any shipping damage to the shipping agent

Retain and use the original packing materials in case re-shipment is necessary.
Checklist for Items supplied with the system

The following items are shipped with all Torqo's.

Input power cable.

Program / Run keys.

Operator's manual.

When calibration equipment is purchased with the system, the certificates of calibration for the beam and weights are included behind the front cover of the manual.

A Certificate of Calibration for your new Torqo II is included behind the front cover of the manual.
System Power Up

What’s Inside

This chapter contains the required information for powering up the Model 1590 Torqo II.

Powering the Torqo II

The system is energized by first inserting the Input Power Cable into the receptacle, marked AC INPUT, on the rear panel of the tower and then plugging the other end of the cable into an AC Outlet.

Now by actuating the switch on this panel the system will be energized and ready for use.

The Torqo II is supplied for use with 110 VAC 60 HZ. Consult the factory or your local sales representative for operation with other voltages.

The use of a surge protector with the Torqo is recommended as a protective measure against electrical noise.
Initial Display After Power-up

The following **Select Test Profile** menu will appear on the touch screen display whenever the system is turned on.

Select Test Profile Menu

![Select Test Profile Menu Image]

LCD Back Light Saving Mode

The Touch Screen Display will shut down automatically after 30 minutes of inactivity. Just touch the screen to refresh the display.
Powering the Optional Printer

The printer should be powered up in accordance with the manual that is supplied with the printer.

All Mesa supplied printers have been pre-tested with a Torqo for functionality.

An interface cable for connecting the printer to the Torqo is supplied when this option is purchased.

This cable should be attached to the printer and then plugged into the connector marked Printer on the rear panel of the tower.

Printer Cable Information

Printer Cable: Serial, Null Modem, 25 Sub-D male to 9 Sub-D female
What's Inside

This chapter contains a description of the Control Panel, Key Lock Switch and EMS Switch.

Control Panel Nomenclature

The titles that are shown on the picture below will be used throughout this manual.
**Touch Screen Display**

The Touch Screen Display is the primary communication link between the user and the system. Just touch an on screen button and the selection is made.

**Key Lock**

The key-lock feature provides for two modes of operation. The Run mode prevents the operator from making any unauthorized changes to the Test Profiles. The Program mode enables the user to create Test Profiles and perform system calibrations.

All of these features will be described in the following chapters of this manual.

**Emergency Motor Stop Switch**

The Emergency Motor Stop Switch will turn the drive motor off when depressed.

It does not turn the power to the system off.
Bottle and Cap Tooling

What’s Inside

This chapter contains the required information for installing and adjusting the tooling that will be used for holding the bottle, gripping the cap and positioning the chuck.

The tooling pictured here may not necessarily be the tooling shipped with your system however the descriptions for installing this tooling are still applicable for most other tooling packages.

Installing Tooling For Holding The Bottle

All Mesa supplied tooling packages are designed to be mounted on top of the Spindle Cap shown in this picture. Screws are provided for holding the tooling in place.

(Qty 2 x .250-20 x 1" Skt Hd Cap Screws)
(Wrench size $\frac{3}{16}$ " Hex.)
The Model 1506A Beverage Bottle clamp is secured to the Torqo by carefully centering it on the shaft that protrudes through the spindle cap and then installing and tightening the Cap Screws that are supplied with the clamp.

The Model 1614 Universal Pin vise is secured to the Torqo by carefully centering it on the shaft that protrudes through the spindle cap and then installing and tightening the Cap Screws that are supplied with the vise.

---

**Installing Tooling For Gripping The Cap**

All Mesa supplied cap chucks are mounted on the drive shaft by tightening a clamp collar on the top of the chuck.

*(Wrench size $\frac{5}{32}$" Hex)*
About the 1506A Beverage Bottle Clamp

The Model 1506A was designed as a quick acting universal holding device that can be easily adjusted to accommodate many different size bottles.

Specifications

- Max Bottle Diameter: 6.5 inches
- Max Bottle Height: 13.5 inches
- Minimum Bottle Height: 4.0 inches

1506A Beverage Bottle Clamp Nomenclature
Adjusting the 1506A Beverage Bottle Clamp

This clamp is easily adjusted for a specific bottle size by following the procedure described below.

**Step 1:**
Loosen the Height Adjusting Knobs and raise the Ring Support Plate to a position greater than the height of the bottle to be tested and slightly tighten one knob. Now place the test sample on the base of the fixture.

**Step 2:**
Now loosen the knob, lower the Ring Support Plate to a position slightly above the sample and slightly tighten one knob again. Now engage the cap chuck to aid in centering the bottle.
Step 3:

Now with both height-adjusting knobs loose, lower the Ring Support Plate until the Rubber Clamp Ring is resting on the bottle. Raise the 2 Clamp Handles so that they are at an angle of approximately 15° off horizontal and then tighten both Knobs.

Step 4:

Push Clamp Handles down to secure a bottle and then raise, to the latched position, for loading the next sample.

The clamping action should not distort the shape of the bottle.
If this occurs, loosen the Height Adjusting Knobs and reduce the 15° angle.
About The 1614 Universal Vise

The Model 1614 Vise was designed as a universal holding device that can be easily adjusted to accommodate both round and square bottles.

Specifications

- Min Bottle Diameter: .62 inches
- Max Bottle Diameter: 6.0 inches

Pin Positioning Chart

The chart below shows the diameter range for each pin position.

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<th>Max. Diameter</th>
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<td>1</td>
<td>.62&quot;</td>
<td>1.12&quot;</td>
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<tr>
<td>2</td>
<td>1.12&quot;</td>
<td>2.00&quot;</td>
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<td>3</td>
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<td>6.00&quot;</td>
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Vise Jaws For Rectangular Bottles

Special vise jaws are frequently supplied for rectangular and unusual shaped bottles. These special jaws are required in order to insure that the bottle is centered under the cap chuck.

See example below.

Adjusting The 1614 Universal Vise

When pins are used for clamping the test sample, the vise should be tightened just enough to hold the bottle but not so tight as to distort the shape of the bottle.

By noting the position of the handle crank and returning to this position when changing samples, the user can rapidly load and unload the vise.
About The Chuck Height Adjuster

The **Height Adjuster** was designed to position the cap chuck at a convenient height for loading and unloading test samples while providing for the minimum amount of vertical chuck motion for the operator.

Positioning The Chuck With The Height Adjuster

Loosen the Height Adjuster Thumb Screw and position the cap chuck approximately 1" above the bottle cap when using the 1506A beverage clamp or 1" above the position that allows the test bottle to be loaded into the 1614 vise or other tooling systems. (See picture below)

Now between tests just lift the cap chuck and let the magnetic height adjuster hold it in position.
Quick Start

What’s Inside

This chapter contains a step-by-step procedure to help the user become familiar with the basic operation of the Torqo II when the key is in Run Mode.

Selecting a Test Profile

On the following menu select Mesa Removal Test.

Select Test Profile Menu

The software will then advance to the Operation Screen, shown on the following page.
Operation and Graphic Display Screen

Observe the Torque display in the center of the screen. It must read Zero before commencing a test.

**Operations Screen**

Zeroing the Display

If the display does not read zero, press the **Zero Key** before proceeding with the sample test sequence.

The display must never be zeroed when the cap chuck is connected to a bottle in the holding fixture. This action can result in an offset that will affect the measurements.
Performing A Test

Now load the bottle to be tested into the holding fixture and clamp the bottle in accordance with the procedure described in the Bottle and Cap Tooling section of this manual.

Encage the cap chuck by gently pressing the drive extension rod down until the chuck engages the cap.

Press the Open Key to commence the testing process.

Live Display

This screen provides a live display of torque during the test.

Testing - Active Screen

During the test, the Stop key can be pressed at anytime to immediately halt the test.
Observe the graph. The torque will increase until the system detects that the cap has released and then the drive will reverse and re-apply the cap to a preset torque value.

The re-application torque is normally set by the user and the procedure for setting it is described in the section of this manual titled Setting the Re-application Torque

The Re-application Torque used in this Test Profile (MESA REMOVAL TEST) is set by default

The chart below shows the default values for the different size Torqo's.

<table>
<thead>
<tr>
<th>Mdl #</th>
<th>Max. Torque (In-lbs)</th>
<th>Application Torque (25%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1590-10</td>
<td>10</td>
<td>2.50</td>
</tr>
<tr>
<td>1590-20</td>
<td>20</td>
<td>5.00</td>
</tr>
<tr>
<td>1590-30</td>
<td>30</td>
<td>7.50</td>
</tr>
<tr>
<td>1590-40</td>
<td>40</td>
<td>10.00</td>
</tr>
<tr>
<td>1590-50</td>
<td>50</td>
<td>12.50</td>
</tr>
<tr>
<td>1590-70</td>
<td>70</td>
<td>17.50</td>
</tr>
<tr>
<td>1590-100</td>
<td>100</td>
<td>25.00</td>
</tr>
</tbody>
</table>

After the cap has been re-applied and the drive has relaxed to zero, both the removal torque and the re-application torque will be displayed in the Testing Complete Screen.
End of Test Display

This screen displays the test results at the end of a test sequence.

Testing - Complete Screen

Before another test can be started the results of the last test must either be discarded by pressing Clear or saved in memory by pressing Save.

For this Quick Start example press Save and this will save the data in memory for Viewing or Printing in the next step.

The software will now return to the Operations Screen.
A graph of the torque measured during the test as well as the precise removal and re-application values will be displayed.

Now press **View / Print** this will produce a menu for displaying and outputting the data that is stored in memory.

### View Print Options Screen

A typical end of test report is shown below.

The options that are available on this menu will be described in the section of this manual titled **Viewing and Printing Test Results**.
Just like 1,2,3, the Torqo II has performed the selected test and the results have been saved.

1. A Test Profile was selected.
   ( The Mesa Labs Removal Test button was pressed. )

2. A test was performed.
   ( The Open Key was pressed. )

3. The test results were displayed and saved.
   ( The Save key was pressed. )
Understanding the Run Mode

What's Inside

This chapter contains a description of the menus and features that are available in the Run Mode.

Run Mode

The purpose of the Run Mode is to prevent the operator from making changes to the Test Profiles that have been created by an authorized person.

The Key on the Control Panel selects this mode.

Now from the Select Test Profile screen shown below, the user may select a test or go to the main menu.

Select Test Profile Screen
In the Quick Start chapter of this manual, a Test profile is selected and a test is performed.

Here we will select Main Menu and detail the features that are provided by the Torqo II in this mode.

---

**Main Menu – Run Mode**

Select Main Menu on the Select Test Profile Screen to advance to the Main Menu Screen.

Those features that can only be accessed in the Program Mode will appear on this screen in a grayed out state.

---

**Main Menu – Run Mode**

![Main Menu Screen](image)

In this menu the user can choose to Select a Test Profile or advance to the Calibration Menu.
Calibration in the Run Mode

When Calibration is selected the software will advance to the following menu.

Main Calibration Screen

At the top of each calibration feature, the date that it was last performed is displayed.

In the run mode, User Calibration can be protected from unauthorized entry by a Password.

This feature is enabled and disabled in the System Options Menu.

When enabled, selecting User Calibration will display the Password Input Screen.

Password Input Screen
The password must be entered precisely as it was first entered.

When entering a password, the case of the text is not ignored.

All three of the Calibration Features shown on the Main Calibration Screen have their own section in this manual.
Understanding the Program Mode

What's Inside

This chapter contains a description of the menus and features that are available in the Program Mode.

Program Mode

The Program Mode enables the user to Create Test Profiles that will test in accordance with the requirements of any given application.

The Key on the Control Panel selects this mode.

Now from the Select Test Profile screen shown below, the user may select a test or go to the main menu.

Select Test Profile Screen
Main Menu – Program Mode

Select Main Menu on the Select Test Profile Screen to advance to the Main Menu Screen.

The features that were grayed out before, in the Run Mode, will now be accessible.

Main Menu Screen

System Information

This is an information screen that provides the user with all the pertinent facts about the system.
System Information Screen

![System Information Screen]

This information may be required when ordering accessories and other spare parts.

System Options

The system options are those program features that will normally be selected once, when the system is installed and seldom changed again.

System Options Screen – Page 1

![System Options Screen]

Page 1

- Units: lb-in
- Standard Deviation Mode: N
- Auto-Save Data: Disabled
- Auto Transmit to PC: Disabled
- Auto Print: Disabled
- View/Print Defaults: [Blank]

TO PAGE 2  OK  CANCEL  PRINT
Some of the system option keys will just toggle from one selection to another while other keys will display a menu.

Pressing the Units key will toggle the selection from lb-in to Kg-cm to Nm. The default selection is lb-in.

Pressing the Standard Deviation key will toggle the selection from N-1 to N for the calculation ($\sigma_x$). The default selection is N-1.

**Standard Deviation Formula**

This formula computes the **mean** value ($\mu$) and the **standard deviation** ($\sigma_x$) of the measured values ($x_i$) for $n$ points.

\[
\sigma_x = \sqrt{\frac{1}{n} \sum_{i=0}^{n-1} \left( x_i - \mu \right)^2}
\]

where $\mu = \frac{1}{n} \sum_{i=0}^{n-1} x_i$, and $n$ is the number of elements in $X$.

Pressing the Auto-Save Key will toggle the selection from Disabled to Enabled. The default selection is Disabled.

Pressing the Auto Transmit Key will display the Data Output to PC menu shown below.
Data Output To PC Screen

Pressing the Single Line – End of Test Data Key will toggle the selection from Disabled to Enabled. The default selection is Disabled.

This feature is provided for outputting results to other PC programs for processing data. For more information on this topic see the chapter in this manual titled Transmitting Data to a PC.

Pressing the Torqo Graphit Key will toggle the selection from Disabled to Enabled. The default selection is Disabled.

This feature is provided for outputting data to Graph-it, Mesa’s comprehensive data analysis program.

Pressing the Auto Print Key will toggle the selection from Disabled to Enabled. The default selection is Disabled.
Pressing the View/Print Defaults Key will display the Select View / Print Options Menu shown below.

**Select View / Print Options**

![Select View / Print Options Menu]

Disabled is the default state for these options.

The View / Print features that are programmable in the above screen will be described later in the chapter titled **Viewing and Printing Test Results**.

Pressing the Decimal place key will display the following menu.

**Enter Number of Decimal Places**

![Enter Number of Decimal Places Menu]
Pressing the Multi-Test key will toggle the selection between Enable, Enable with Save and Disable.

Pressing the Calibration Selection key will toggle the selection between factory and user calibration.

Pressing the Password Key will cause the Password Input Screen to be displayed.

Pressing the Delete Data Key will toggle the selection between Enable and Disable.

**Print the System Options**

The print key at the bottom of the System Options Screen enables the user to produce a hard copy of the settings.
It is always a good idea to produce hard copy of the System Option settings and the Test Profile settings.
Profile Manager

The Profile Manager portion of the Torqo II software is used to create the Test Profiles.

When Profile Manager is selected, a screen similar to the one shown below will be displayed.

In the gray area of the screen, the name and the test parameters for the last selected test profile, will be displayed.

![Profile Manager Screen]

The Profile Manager screen for all Test Types will contain the Action Buttons pictured below.

**Action Buttons – Profile Manager**

- Select
- Edit
- New
- Delete
- Print
- OK
- Advanced View
- Set Defaults
The profile manager for the removal test has been selected for the following explanations in this manual.

**Profile Manager – Removal Test**

![Profile Manager – Removal Test](image)

**Select Key - Profile Manager**

This key will return the user to the Test Profile selection menu.

**Edit Key - Profile Manager**

This key will enable the user to edit the currently selected Test Profile.

The Two Edit Screens for a Removal Test are shown below.
Removal Test Setup Screen (Basic View)

A check mark will appear next to Advance View when these features are to be displayed.

Removal Test Setup Screen (Advanced View)

When a Blue Button is touched, on a Test Setup Screen, the Edit Screen for that feature will be displayed.

The text on an advance screen button will be yellow.
Press the Name key to commence the editing process.

**Edit Name Screen**

This screen is used to edit the name of the currently selected Test Profile.

Press the Low Limit key to commence the editing process.

**Edit Low Limit Screen**

This screen enables the user to program a Low pass/fail limit.

Press the High Limit key to commence the editing process.

**Edit High Limit Screen**

This screen enables the user to program a High pass/fail limit.

Press the Application key to commence the editing process.
Edit Application Torque Screen

This screen enables the user to input a torque value for re-applying the cap at the end of a test.

See section titled **Setting the Re-application Torque**.

Press the Header key to commence the editing process.

**Edit Header / Comment Screen**

This screen enables the user to program a Header and a Comment that will appear on the printout of the test results.

Press the Speed key to commence the editing process.

**Edit Speed**

This feature is provided for selecting a test speed when the Multi-Speed Option is purchased.
Press the Peak Detect key to commence the editing process.

**Edit Peak Detect**

This is the distance in degrees that the Torqo will drive after detecting a peak torque value in search of a higher peak.

Press the Min Torque key to commence the editing process.

**Edit Minimum Torque**

This screen enables the user to enter a minimum torque value that must be exceeded for a test to be legitimate.

Press the Extra Travel key to commence the editing process.

**Edit Extra Travel**

This feature enables the user to enter a distance to drive the cap after the removal measurement has been made. This will leave the cap loose for easy removal.
New Key - Profile Manager

This key will enable the user to create a new Test Profile.

The following menu will be displayed when New is selected.

Select Test Type Menu

The first step in creating a new Test Profile is to select the Test Type. Once this is done the software will advance to the following screen.

Enter Profile Name Screen

Here the user must enter a name and then select OK to advance.
The software will then return to the Profile Manager Screen with the newly entered information and test type displayed.

### Delete Key – Profile Manager

The delete key will remove the current Profile and the Data that has been saved.

The following screen will be displayed to confirm this selection before execution.

### Delete Profile Screen
When a Test Profile is deleted all data stored with that profile will be deleted.

For more information on deleting data see the chapter in this manual titled Deleting and Replacing Data.

Print Key – Profile Manager

The print feature here is used to provide Hard Copy of a Test Profile.

Set Defaults Button

This button can be found in the lower right hand corner of the Test Profile Manager Screen. When pressed, the software will reset all of the factory defaults.
Test Types and Their Menus

What's Inside

This chapter contains a description of the Torqo II test types and the menus that are used to select and program them.

Test Types

The Torqo II was designed to perform 7 basic tests as shown below in the Select Test Type Menu.

Select Test Type Menu

![Select Test Type Menu](image-url)
Removal Test

This Test is used to measure the Removal Torque on conventional threaded bottles and caps.

Rotating the cap in the counter-clockwise direction until the cap releases performs the test.

Removal and Incremental

This Test is used to measure the removal torque as well as the Incremental Torque in a single test cycle.

Rotating the cap in the counter-clockwise direction until the cap releases and then re-applying the cap to a position that is 6 degrees past the initial starting position performs this test.

Removal and Bridge

This Test is used to measure the removal torque as well as the Bridge Torque in a single test cycle.

Rotating the cap in the counter-clockwise direction until the cap releases and then continuing to drive until the Bridges on the tamper evident band break performs this test.

Reverse Ratchet

This Test is used to measure the torque required to rotate a child resistant closure in the free running state. (i.e. No vertical down force)

This test is performed by rotating a child resistant cap in the counter-clockwise direction for 1 complete revolution while looking for and storing the highest measured torque value.
Close

This Selection enables the system to be used as a capping device. When used in this mode the actual closing value can be saved and outputted.

Strip

This test is designed to measure the torque required to strip the threads.

Rotating the cap in the clockwise direction until the threads yield performs the test.

Copy Profile

This feature is provided on the select test screen as a method of duplicating a test that has features that are close to the desired features for a new test.

ROPP (Roll on Pilfer Proof)

The ROPP test is designed to measure the following attributes:
1) Performs a removal test (1st Peak Torque)
2) Once the removal is performed the unit will drive the cap until the bands break (2nd Peak Torque)
3) Finally the unit will drive the cap until it completely strips (3rd Peak Torque)
Removal Test Menus

After selecting Removal Test and inputting a name, the following menu will be displayed.

Removal Test Menu

The default settings for a Removal Test will be displayed.

Selecting Edit will enable the user to change the default settings to meet the requirements of the application.

Removal Edit Menu
Removal and Incremental Test Menus

After selecting Removal and Incremental Test and inputting a name, the following menu will be displayed.

**Removal and Incremental Test Menu**

![Removal and Incremental Test Menu Image](image)

The default settings for a Removal and Incremental Test will be displayed.

Selecting Edit will enable the user to change the default settings to meet the requirements of the application.

**Removal and Incremental Edit Menu**

![Removal and Incremental Edit Menu Image](image)
Removal and Bridge Test Menus

After selecting Removal and Bridge Test and inputting a name, the following menu will be displayed.

Removal and Bridge Test Menu

The default settings for a Removal and Incremental Test will be displayed.

Selecting Edit will enable the user to change the default settings to meet the requirements of the application.

Removal and Bridge Edit Menu
Reverse Ratchet Test Menus

After selecting Reverse Ratchet Bridge Test and inputting a name, the following menu will be displayed.

Reverse Ratchet Test Menu

![Reverse Ratchet Test Menu](image)

The default settings for a Reverse Ratchet Test will be displayed.

Selecting Edit will enable the user to change the default settings to meet the requirements of the application.

Reverse Ratchet Edit Menu

![Reverse Ratchet Edit Menu](image)
Close Test Menus

After selecting Close Test and inputting a name, the following menu will be displayed.

**Close Test Menu**

![Close Test Menu Image]

The default settings for a Close Test will be displayed.

Selecting Edit will enable the user to change the default settings to meet the requirements of the application.

**Close Edit Menu**

![Close Edit Menu Image]
The operations screen for a Close test and a Strip test is different than the operations screen for all of the removal type tests.

On the Close Operation Screen shown below the Open feature has been removed to prevent the operator from accidentally selecting the wrong direction of rotation.

**Close Operations Screen**
Strip Test Menus

After selecting Strip Test and inputting a name, the following menu will be displayed.

Strip Test Menu

The default settings for a Strip Test will be displayed.

Selecting Edit will enable the user to change the default settings to meet the requirements of the application.

Strip Edit Menu
Roll on Pilfer Proof (ROPP) Test Menus

After selecting the ROPP Test and inputting a name, the following menu will be displayed.

**Roll on Pilfer Proof (ROPP) Test Menu**

The default settings for a ROPP Test will be displayed.

Selecting Edit will enable the user to change the default settings to meet the requirements of the application.

**Roll on Pilfer Proof (ROPP) Edit Menu**
Creating a New Test Profile

What's Inside

This chapter contains a step-by-step procedure for creating a new test profile.

Creating a New Profile for a Removal Test

The Control Panel Key must be in the Program position to perform the following steps.

On the Main Menu Screen select Profile Manager.

The Tests Profile Manager screen will now display the last selected test type.

Now on this screen select New.
On the Select Test Type screen select Removal.

On the Enter Profile Name screen type the desired name and then select OK.

The Tests Profile Manager screen will now display the selected test type.
Now review the selected test features and edit if required.

A new test profile, with a new name, has been created.
Understanding the Operation Screen

What's Inside

This chapter contains a description of the features that are available on the Operation Screen.

Operation Screen Features

The operation screen will be displayed after a test profile has been selected and after a test has been performed.

Operations Screen

At the top of the screen, the name of the currently selected test profile will be displayed.
Beneath the title block, the start test button for Open and Close can be found on either side of the live torque display.

![OPEN 0.00 CLOSE](image)

The next row of features contains the end of test removal torque display, a Pass/Fail Indicator and the re-application torque display.

![RENEWAL 0.00 lb-in PASS RE-APPLICATION](image)

The bottom left portion of the screen contains a graphic display of the actual test.

![Graph](image)

The remaining features can be found to the right of the graphic display.

**ZERO**

This key is used to zero the display before testing.

**VIEW / PRINT**

This key is used to view the test results in memory before printing.

**TEST PROFILE**

This key will return the software to the Test Profile Menu.

**COUNT: 0**

This indicator displays the number of samples in memory.
Setting the Re-application Torque

What's Inside

This chapter contains a description of the procedure for programming a Re-application Torque.

The torque value programmed here will also be used as the Close Value when using the system to apply caps.

Entering a Torque

The following procedure will enable the user to enter a re-application torque.

The Re-application feature is only used in a Removal Test Type.

In the Select Test Profile menu select Main Menu

The software will then advance to the Main Menu.
In the Main Menu select Profile Manager.

The software will then advance and display the Test Menu for the currently selected Test Profile.

If the test type in this Test Profile is not a removal test, select another Profile or create a new Profile with a removal test in it. Now select edit.

The software will then advance to the Removal Test Edit menu.

Now select Application Torque.

The software will then advance to the edit application menu.

Key in the desired value and select OK.

The procedure for setting the re-application torque is now complete.
Viewing and Printing Test Results

What's Inside

This chapter contains a description of the procedure for customizing the report that can be viewed and printed at the end of a test session.

Customizing the End of Test Report

On the Operation Screen, shown below press the View / Print Button.

![View / Print Button](image)

The software will now display the View Print Screen.
View Print Screen

The option keys shown to the right of the report, enables the user to customize the report prior to printing.

The changes made here, prior to printing, are not stored in memory. They will only be applied to the current printout with one exception. Once a lot number has been entered, it will remain with the test profile until deleted.

Entering a lot number

When Lot Number is selected, the alphanumeric keyboard will be displayed for entering the value.

Modifying The Report

When the modify key is pressed, the software will display the following options screen.
Select View Print Options Screen

Pressing the Signature Key will toggle the selection between enable and disabled. When enabled the report will have 2 lines for signatures.

Pressing the Profile key will toggle the selection between disabled, limits or all. When features are selected, they will be included in the printout.
Pressing the Data key will toggle the selection between enabled and disabled. When enabled the test data will be included in the printout.

Pressing the Summary key will toggle the selection between enabled and disabled. When enabled the test summary data will be included in the printout.
Pressing the delete data key will display the following screen to confirm this action before executing the deletion.

**Deletion Confirmation Screen**

For more information on deleting data see the chapter in this manual titled Deleting and Replacing Data.
Deleting and Replacing Data

What's Inside

This chapter contains a description of the procedure for deleting and replacing data that has been saved.

Starting the Deletion Process

This process begins by first selecting View / Print on the Operation Screen.

The software will then display the data stored in memory for the current Test Profile.

View /Print Report Screen
On the View / Print Report Screen press Delete Data.

The software will then advance to the Delete Data Menu.

Delete Data Menu

In the Sample # window, the number of the last saved sample will be displayed.

Pressing Delete sample now will cause the software to display the following confirmation screen.

Delete Sample # Confirmation Screen

The deletion of the selected sample can be aborted here by selecting Cancel.

If OK is selected, Sample # 11 will be deleted and the file will now contain 10 samples.

When a sample is deleted, the software will return the user to the Operation Screen.
Deleting a specific Sample #

The following procedure enables the user to delete a specific sample #.

Press the Sample # key and the Sample Number input screen will be displayed.

![Sample Number Input Screen](image)

Press the clear entry key and then enter the number of the sample you wish to delete.
Then press Ok and once again the confirmation screen will be displayed.

![Confirmation Screen](image)

The deletion of the selected sample can be aborted here by selecting Cancel.
If OK is selected, the displayed Sample # (11) will be deleted and the file will now contain 10 samples.

Once again the software will return to the Operation Screen.

Replacing a Sample

The following procedure enables the user to replace a specific sample #.

Press the Replace Sample # key and once again the Sample Number input screen will be displayed.
Press the clear entry key and then enter the number of the sample you wish to replace.
Then press Ok and once again the confirmation screen will be displayed.

The replacement process can be aborted here by selecting Cancel.
If OK is selected, the displayed Sample # (5) will be deleted and the software will return to the Operations Screen where a test must be performed in order to complete the replacement process.

If a test is not performed, the replacement process will be cancelled.

**Deleting All Data**

The following procedure will delete all saved data for the current test profile.

Press Delete All and the software will once again display a confirmation screen.

The deletion of all the samples can be aborted here by selecting Cancel.
If OK is selected, all the samples for the current test profile will be deleted.
Performing a Life Test

What's Inside

This chapter contains a description of the procedure for performing a life test on a closure system by removing and re-applying the cap a programmable number of times.

Programming the Test

In the Main Menu select System Option and then press the Multi-Test key to enable this feature.

Now when Open is pressed to start a test, the following screen will appear for inputting the number of repetitions.

After inputting the number of repetitions, the test will commence when OK is pressed.
Gold Bottle Verification

What's Inside

This chapter describes the Gold Bottle and the procedure for using it to verify the calibration of the Torqo II.

Gold Bottle Description

The Model 1612 Gold Bottle is used to quickly verify the calibration and operational repeatability of the Model 1590 series torqo's. This bottle is pre-set at the factory to a customer specified torque value.

Each Gold Bottle is labeled with its exact torque rating. Since the cap torque of this bottle is the torque produced by a permanent magnet assembly, the value will always be the same. Therefore when tested on the Torqo, the measured value should always repeat unless something has been damaged.

The bottle is normally supplied with the customers cap so that the customers Torqo Cap Chuck can be used in the testing process.

These Gold Bottles are readily available and their torque can be certified on an annual basis.
Using the Gold Bottle

The following step-by-step procedure will guide the user through the Gold Bottle Verification process.

Selecting the Test

On the Main Menu select Calibration.

Main Menu Screen

![Main Menu Screen](image)

The software will then advance to the main Calibration Menu.

On the Calibration Menu select Verification with Gold Bottle.

The software will then advance to the Gold Bottle program screen.
Gold Bottle Program Screen

Before running a verification, the user should input the serial number of the Gold Bottle to be tested.

Mesa recommends that a minimum of 5 repetitions be entered when performing a verification.
The default test direction is ccw. (Removal direction)

When Next is selected, the software will advance to the Gold Bottle Zero torque screen.

Now by following the directions on the screen the software will advance to the test screen.
The verification report will automatically be displayed.

**Gold Bottle Verification Report**

```
TORQO
Serial #: 07-9001
GOLD BOTTLE VERIFICATION 4/13/2007
8.01 lb-in
8.01 lb-in
8.01 lb-in
8.01 lb-in
8.01 lb-in
8.01 lb-in
8.01 lb-in
8.01 lb-in
```

The torque reading on the display should now match the value printed on the Gold Bottle Label.

**The allowable variation is computed by adding together the tolerance on the bottle and the +/- .5% FS tolerance of the machine.**

Selecting View Gold Bottle Verification on the Main Calibration Screen can recall these results.
System Calibration

What's Inside

This chapter is intended to acquaint the user with the required Calibration Equipment, the Calibration Verification Process, the process for performing a User Calibration and the procedure for Selecting the Calibration to be used.

General Calibration Information

The Torqo is supplied with a factory Calibration that is burned into read-only memory. This is done so that the user will always have a backup calibration when an incorrect user calibration is performed.

 Calibration Frequency

Checking the calibration of the Torqo at least twice a year is recommended when the system is used frequently.

Required Calibration Equipment

The following list of equipment is required to perform a Torqo Calibration. When ordering this equipment please provide the Model Number and Serial Number of the machine that the equipment will be used on.
1. Calibration Beam (Disk)
2. Calibration Fixture
3. Calibration Weight Set

**Calibration Beam**

The calibration beam is a disk with a diameter of precisely 8.000 inches. Each disk is serialized and the actual diameter is stamped on the bottom. The beam is supplied as an assembly of the following parts.

1. Calibration Disk (C-19935)
2. Calibration Cables (A-21013)

**Calibration Fixture**

The calibration fixture is supplied as an assembly of the following parts.

1. Calibration Bracket (D-19936)
2. Cable Pulleys (B-19870)
3. Retain Rings (N5100-25)

**Calibration Weight Set**

The calibration weight set consists of three weights that are selected to provide a torque of 25%, 50% and 75% of the full-scale torque of the Torqo.

(See chart below)
Calibration Weight Chart

The required weight in lbs for producing a specific torque can be computed by dividing the desired torque value by 4, since 4 inches is the Radius of the calibration beam.

This chart shows the weights that Mesa supplies when a calibration kit is purchased. The 100% value is obtained by combining the 25% and 75% weights.

<table>
<thead>
<tr>
<th>Torque Capacity</th>
<th>5 in-lb</th>
<th>10 in-lb</th>
<th>20 in-lb</th>
<th>30 in-lb</th>
<th>40 in-lb</th>
<th>50 in-lb</th>
<th>70 in-lb</th>
<th>100 in-lb</th>
</tr>
</thead>
<tbody>
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<td>.3125</td>
<td>.625</td>
<td>1.250</td>
<td>1.875</td>
<td>2.500</td>
<td>3.125</td>
<td>4.375</td>
<td>6.250</td>
</tr>
<tr>
<td>50%</td>
<td>.6250</td>
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<td>3.750</td>
<td>5.000</td>
<td>6.250</td>
<td>8.750</td>
<td>12.500</td>
</tr>
<tr>
<td>75%</td>
<td>.9375</td>
<td>1.875</td>
<td>3.750</td>
<td>5.625</td>
<td>7.500</td>
<td>9.375</td>
<td>13.125</td>
<td>18.750</td>
</tr>
<tr>
<td>100%</td>
<td>1.250</td>
<td>2.500</td>
<td>5.000</td>
<td>7.500</td>
<td>10.000</td>
<td>12.500</td>
<td>17.500</td>
<td>25.000</td>
</tr>
</tbody>
</table>

Selecting a Calibration to be used

When a Torqo is shipped, the factory calibration is Enabled in the System Options Menu.

When a User Calibration is performed, this selection will automatically change from Factory Enabled to User Enabled.

Performing a Calibration Verification

This procedure is used to verify that the Torqo is in calibration and to produce a hard copy of the measured values when a Torqo Printer is connected to the system.

The first step in this procedure is to install the Calibration Fixture on the Torqo.
Installing the Calibration Fixture

The calibration fixture mounts on the front of the Torqo as shown in the display.

To install the fixture, loosen the two $\frac{5}{16}$ Socket Head Cap Screws that can be accessed from under the base plate and then insert the fixture under the base plate. Now re-tighten the bolts.

(Wrench Size $\frac{1}{4}$ " Hex)

Installing the Calibration Beam

The beam is installed by first removing any bottle holding tooling and then carefully placing the beam on top of the spindle cap.

Screws are provided for holding the beam in place.

(Qty 2 x .250-20 x 1" Skt Hd Cap Screws)

(Wrench size $\frac{3}{16}$ " Hex.)
Starting the Verification Test

On the Main Menu press calibration.

Main Menu Screen

The software will now advance to the main Calibration Screen

Main Calibration Screen

Select User Verification and the program will advance to the first of Verification Screens.
Verification – Zero Screen

Now follow the directions as displayed on the screen.

After the display has been zeroed, the continue key will advance the program to the screen shown below.

User Verification Test Screen

The directions on the screen will guide the user through the process of hanging the weights and capturing the readings.
The process begins by hanging a 25% weight on the CW side and ends with a 100% weight on the CCW side.

Upon completion of this procedure, a calibration chart similar to the one pictured below can be printed.

**Calibration Verification Chart**

Now compare the values in the above chart with the theoretical values that can be found in the tables below.

**Calibration Specification Charts**

<table>
<thead>
<tr>
<th>Model 1590-5   ( Torque Capacity 5 lb-in )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque in % Capacity</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>75</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 1590-10  ( Torque Capacity 10 lb-in )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque in % Capacity</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>75</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>Torque in % Capacity</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>75</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 1590-20 (Torque Capacity 20 lb-in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque in % Capacity</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>75</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 1590-30 (Torque Capacity 30 lb-in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque in % Capacity</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>75</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 1590-40 (Torque Capacity 40 lb-in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque in % Capacity</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>75</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>
### Model 1590-50 (Torque Capacity 50 lb-in)

<table>
<thead>
<tr>
<th>% Capacity</th>
<th>Torque in lb-in</th>
<th>Torque in % Capacity</th>
<th>Tolerance in +/- % FS</th>
<th>Tolerance +/- lb-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>12.50</td>
<td>25</td>
<td>.5</td>
<td>.25</td>
</tr>
<tr>
<td>50</td>
<td>25.00</td>
<td>50</td>
<td>.5</td>
<td>.25</td>
</tr>
<tr>
<td>75</td>
<td>37.50</td>
<td>75</td>
<td>.5</td>
<td>.25</td>
</tr>
<tr>
<td>100</td>
<td>50.00</td>
<td>100</td>
<td>.5</td>
<td>.25</td>
</tr>
</tbody>
</table>

### Model 1590-70 (Torque Capacity 70 lb-in)

<table>
<thead>
<tr>
<th>% Capacity</th>
<th>Torque in lb-in</th>
<th>Torque in % Capacity</th>
<th>Tolerance in +/- % FS</th>
<th>Tolerance +/- lb-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>17.50</td>
<td>25</td>
<td>.5</td>
<td>.35</td>
</tr>
<tr>
<td>50</td>
<td>35.00</td>
<td>50</td>
<td>.5</td>
<td>.35</td>
</tr>
<tr>
<td>75</td>
<td>52.50</td>
<td>75</td>
<td>.5</td>
<td>.35</td>
</tr>
<tr>
<td>100</td>
<td>70.00</td>
<td>100</td>
<td>.5</td>
<td>.35</td>
</tr>
</tbody>
</table>

### Model 1590-100 (Torque Capacity 100 lb-in)

<table>
<thead>
<tr>
<th>% Capacity</th>
<th>Torque in lb-in</th>
<th>Torque in % Capacity</th>
<th>Tolerance in +/- % FS</th>
<th>Tolerance +/- lb-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>25.0</td>
<td>25</td>
<td>.5</td>
<td>.5</td>
</tr>
<tr>
<td>50</td>
<td>50.0</td>
<td>50</td>
<td>.5</td>
<td>.5</td>
</tr>
<tr>
<td>75</td>
<td>75.0</td>
<td>75</td>
<td>.5</td>
<td>.5</td>
</tr>
<tr>
<td>100</td>
<td>100.0</td>
<td>100</td>
<td>.5</td>
<td>.5</td>
</tr>
</tbody>
</table>

All readings should be within the specified tolerance range. If the readings are not within the tolerance range, a User Calibration should be performed.
Performing a Calibration

Press calibration on the Main Menu to display the Main Calibration Screen.

**Main Calibration Screen**

Select User Calibration and the program will advance to the first of the Calibration Screens.

**Calibration – Zero Screen**

Now follow the directions as displayed on the screen.
User Calibration Screen

The directions on the screen will guide the user through the process of hanging the weights and capturing the readings.

This procedure must be followed carefully to insure the accuracy of the system.

The process begins by hanging a 25% weight on the CW side and ends with a 100% weight on the CCW side.

If a weight is hung on the wrong side during the procedure, the following display will appear.
If when a weight is applied, the measured value is between 5% and 7.5% away from the expected value, a warning screen will be displayed.

This message indicates that there may be a problem with the system and the Calibration should be checked frequently.

If the measured value is more than 7.5% away from the expected value the software will prevent the user from continuing.

When this procedure is complete, the software will advance to the following screen.

![User Calibration Screen]

When OK is selected, the calibration verification process will be initiated.

Once the Verification is complete, the Torqo II will be ready for use.
Child Resistant Cap Option

What's Inside

This section is indented to acquaint the user with the features and use of this option.

About the Child Resistant Option

This option enables the Torqo to provide a pre-settable down force for push and turn caps.

An air supply with the ability to provide a minimum of 30 PSI is required.

Once connected to the air, the down force can be set to the required force for a given application.

Connecting the Air Supply

The air supply connects to the air filter on the rear of the tower.

This connection is a ⅛ NPT thread.

Both the air filter and regulator are designed for a maximum of 100 PSI however the Force Gauge is limited to 30 PSI.
**Adjusting the Down Force**

Once connected, the Air Control Knob should be adjusted to provide the required amount of down force. Observe the down force gauge on the front of the tower cover while adjusting the knob.

In most cases, a down force of 15 to 20 lbs will open a child resistant closure.
Down Force Mechanism Nomenclature

The names in the callouts below will be used when describing the setup and adjustment of the Child Resistant Down Force Mechanism.

Adjusting the Down Force Foot

The Down Force Foot applies the force on the cap by pressing down on the Drive Shaft Bearing when the Down Force Switch is actuated.
To adjust the foot put the Down Force switch in the up position and then place the sample to be tested in the bottle holding fixture.

Now position the Cap Chuck on the cap by lowering the drive shaft.

Pivot the Down Force Foot over the top of the Drive Shaft Bearing and adjust for approximately 1/16 of an inch of clearance. (i.e. the thickness of a quarter)

Loosening the Foot Position Shaft Clamp and sliding the Foot Support Shaft up or down and then retightening the clamp makes this adjustment.

---

**Operating the Child Resistant Mechanism**

Once the mechanism has been adjusted, a sample is tested by pivoting the foot into position and actuating the Down Force Switch.

At the conclusion of the test cycle, move the switch to the up position and pivot the foot to the rear.

Repeat this procedure for the next sample.
Using Windows CE

What's Inside

This chapter contains a description of the Windows CE feature and its use in the Torqo II.

Windows CE

Window CE is the operating system for the touch screen display and the platform for the Torqo II software.

Main Menu Screen

By selecting Exit to Windows CE on the screen above, the software will display the CE desktop.
Windows CE Desktop

The System Settings for the Torqo II are set by Mesa personnel prior to shipment and should not require any field adjustment with one exception, the clock.

On the Desk Top double click on My Device. Then double click on Control Panel. Then double click on Date/Time. Now make sure the time zone is correct and then adjust the clock and select apply.
Transmitting Data to a PC

What’s Inside

This chapter provides a description of the output port, cable requirements, communication protocol and procedure for transmitting test results automatically.

Output Port

PC Out

The Torqo II is supplied with an RS-232 serial communication port for connecting to a personnel computer.

Cable Requirements

The cable that connects the Torqo II to the PC should have the following description.

Serial Type, Null Modem, 9 Sub-D female to 9 Sub-D female
Communication Protocol

Data is transmitted in normal ASCII format with the following specifications.

Baud Rate: 9600
Data Bits: 8
Stop Bits: 1
Parity: No
Xon / Xoff: Yes

Data Format Information

When transmitting Single Line End of Test results the following data strings are used for the different Test Profile Types.

Removal Torque Data String

Date_Time_Units_Removal Torque_Test Type_Re-
Application Torque<CR><LF>
Example:
01/01/00 09:00 lb-in 10.80 rem 15.00<CR><LF>

Incremental Torque Data String

Date_Time_Units_Removal Torque_Test Type_Incremental
Torque<CR><LF>
Example:
01/01/00 09:00 lb-in 10.80 inc 12.00<CR><LF>

Bridge Torque Data String
Transmitting to a PC

Date_Time_Units_Removal Torque_Test Type_Bridge Torque<CR><LF>
    Example:
    01/01/00 09:00 lb-in 10.80 brg 1.15<CR><LF>

Reverse Ratchet Torque Data String

Date_Time_Units_Torque_Test Type_<CR><LF>
    Example:
    01/01/00 09:00 lb-in 10.80 rrt <CR><LF>

Close Torque Data String

Date_Time_Units_Close Torque_Test Type_<CR><LF>
    Example:
    01/01/00 09:00 lb-in 10.80 close <CR><LF>

Strip Torque Data String

Date_Time_Units_Strip Torque_Test Type_<CR><LF>
    Example:
    01/01/00 09:00 lb-in 10.80 close <CR><LF>
Transmit Single Line End of Test Results

This feature is selected from the System Options Screen.

Press the Auto Transmit to PC button and the software will advance to the menu shown below.

In the Data Output Menu only one of the items can be enabled. The other item will automatically be disabled.

Transmit to Torqo Graph-it

For more information on this option contact Sales at Mesa.
Maintenance and Cleaning

What's Inside

This chapter describes the recommended maintenance and cleaning procedures for a Torqo and its tooling.

General Information

The Torqo is designed to operate for many years with the minimum amount maintenance.

However the Torqo, like any precision measuring tool, should be periodically checked for accuracy. (See System Calibration)

The calibration of the Torqo should be checked at least twice a year.

A protective cover can be supplied for those applications where wash downs are frequently performed.

General Maintenance

Keep the system clean, for this will make the use of the Torqo more pleasurable.

Disconnect the power to the system when cleaning.
Clean the exterior with a mild detergent and a soft cloth. Avoid abrasive cleaners that may scratch the lens on the torque display and the keypad.

**Cleaning the Tooling**

The functionality of the bottle holding tooling and the chucks should be periodically checked. All bottle tooling should move smoothly and easily. Chucks should slip onto caps with the minimal amount of force.

**Cleaning the 1506A Bottle Clamp**

This tool is made from corrosion resisting materials and therefore it can be fully submerged in hot soapy water for cleaning. Remove the fixture by unscrewing the 2 mounting screws and lifting straight up. Make sure the center hole is clean before re-installing the fixture.

**Cleaning the 1614 Pin Vise**

This tool can also be submerged in hot soapy water but care should be taken to thoroughly dry the lead screw and then it should be lubricated with light oil.
Glossary of Terms

**Bridge Torque**
The rotational force required to break the bands between a cap and a damper evident band.

**Incremental Torque**
The force required to rotate a cap to a position 6 degrees past the initial position in the tightening direction.

**Profile**
The name given to the collection of options, features and test parameters that have been selected for a test.

**Re-application Torque**
The rotational force that will be applied to a cap when re-tightening it.

**Removal Torque**
The rotational force required to loosen the cap on a threaded container.

**RS-232**
A serial communication standard for data exchange.
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